INTEGRATED VISUAL DATA TECHNOLOGY INC.
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Installation, Calibration, Set Up & Operation Manual

ED3/ED4-EP CubeFreight System

Electric Pallet Truck Freight Dimensioning & Check Weighing Scale

Lift Accurate Technology

ED3/ED4-EP V138

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General Installation Guide

This **ED3-EP** and **ED4-EP** CubeFreight V138 Series installation & calibration guide describes how to install, calibrate, test and use your on-board electric pallet truck check weighing scale. Following the instructions in the ADMINISTRATION MENU guide will enable you to get the system set up and weighing calibration function operating quickly. In the event that you require additional assistance, please contact customer support via e-mail at support@skidweigh.com , visit www.skidweigh.com or contact us at the address or contact number below:

Integrated Visual Data Technology Inc.
3439 Whilabout Terrace, Oakville, ON, Canada, L6L 0A7
Phone: 905-469-0985

Safety

Always disconnect the vehicle battery while installing SkidWeigh system or any other electronic product.
Make sure that unit, pressure transducer and any other associated cables are securely mounted and do not impede any of the vehicle's controls. Use care when routing the components cables. Route the cables where they will be protected. Use commonly accepted install practices for after market industrial vehicle electronic devices.
The installation of the SkidWeigh systems should only be performed by an acknowledged lift truck dealer technician or end user electro and hydraulic technical installer.
Here are two acceptable methods of making a wire connections:
* Soldering your connections (recommended)
* Crimp connectors (with the use of the proper crimping tool)
Regardless of the method you choose, ensure that the connection is mechanically sound and properly insulated. Use high quality electrical tape and shrink tubing where necessary. This product is connected directly to the vehicle's ignition switch, 12 to 55 VDC. There is on-off power switch on the top of the digital indicator.

Electro-Magnetic Compatibility

CE conformity to EC directive 89/336 (EMC) by application of harmonized standards: Interference stability EN 61000-6-2 and EN 61326-1 interference emit EN 61000-6-3, EN 61326-1 for the pressure transducer.

ED3/ED4-EP CubeFreight

Our policy is one of continuous improvement and the information in this document is subject to change without notice. The software version is displayed on the LCD display once the power is turned on to the system.

Overview of components

The standard ED3/ED4-EP CubeFreight system consist of two main components:
* Digital indicator ** with wiring harness, mounting bracket and anti-vibration mount
* Hydraulic pressure transducer with 3 wires cable
* Installation & calibration manual and operator usage instruction

** The ED3/ED4-EP Series configuration might consist of additional hardware. Depending on the system application the additional hardware such as USB port, operator access control RFID card reader, Bluetooth module, RF module, etc., might be included in the indicator.

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Operational principal

The ED3-EP and ED4-EP CubeFreight operational principal is based on the hydraulic pressure transducer mounted in the vehicle lifting hydraulic circuit and lift accurate technology. The load should be placed all the way in towards the load back guard. With the load lowered to the ground the LCD display will show time and date which is a starting point to initiate a load weight procedure.

Operational Cycle

Operator must activate lift control switch and hold it until the loaded forks are automatically stopped at the measurement height based on the pressure transducer input signal. The increase in the hydraulic pressure signal will initiate specific “weighing cycle” measurement algorithm for activation of the lift accurate technology process that will automatically stop lifted forks at predetermined height. As soon the loaded forks are stopped the system will take a series of measurements and within 3-4 seconds the load weight will be shown on LCD display. With load weight shown on LCD display the system lift motor travel control will be enabled.

Pressure transducer installation

The pressure transducer must be installed in the lifting hydraulic line between the lift control valve and lift cylinder(s).

Mount a T-piece in lifting hydraulic line.

Pressure transducer installation precautions

Before installation of the pressure transducer the hydraulic lift circuit must be pressure free.
Pressure transducer has 1/4”-18 NPT male thread.
Use thread seal to ensure tight fit.

Selecting the mounting location for digital indicator

Note: Use the mounting bracket with the anti vibration mount and fasten digital indicator on the vehicle dashboard. There are many examples of mounting locations that will depend on the vehicle model. However, additional mounting items such as a flat brackets may be needed to help secure digital indicator.

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Electrical connections

All CubeFreight systems operate from 12 to 55 VDC.

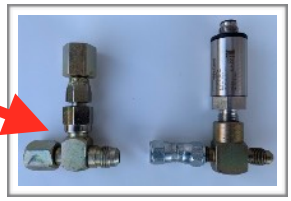
- Orange Wire (+) Ignition switch On position
- Brown Wire (-) Battery negative
- Red Wire, connect to RED wire of the pressure transducer cable
- Black Wire, connect to BLACK wire of the pressure transducer cable
- White Wire, connect to WHITE wire of the pressure transducer cable
- **OPTIONAL: Green** and **Blue** are used for vehicle disable. Internal relay contacts are normally open. When valid operator ID# or RFID card is inputed into the system, relay will close and stay closed until next time power to vehicle is turned off. Connect wires in series with one of the wires going to vehicle power on switch.

Two Black wires are connected to internal relay, dry contacts located in ED3/ED4-EP digital indicator.
This internal relay is controlled by the microprocessor and will be activated only during the load weighing cycle. The relay configuration is SPST, normally closed contacts, 5 A current ratting

Pressure transducer

Use T-piece and adapter(s) to accommodate 1/4”-18 NPT

Male Port 1/4”-18 NPT



Power short circuit protection

All CubeFreight systems are internally short circuit protected with resettable fuse. There is no need to install external inline fuse in orange wire connected to the ignition switch.
Note: *Any external devices connected to the SkidWeigh system, such as non standard onboard printer might require external fuse.*

How to program keypad operator vehicle access ID#’s (If applicable)

- With power turned on to the system the LCD display will indicate to **“ENTER ID NUMBER”**

LCD Display
ENTER ID NUMBER
ID =

- Input code **742F**. The LCD display will prompt you to input first valid operator ID#.

(Any number in range from 1 to 999) and press **“Enter key”** ↵.

LCD Display
ENTER VALID IDS
ID 1 = 111

- LCD display will advance and prompt you to input second valid operator ID# and press **“Enter key” ↵.**

LCD Display
ENTER VALID IDS
ID 2 = 222

- LCD display will advance and prompt you to input third valid operator ID# and so on.

LCD Display
ENTER VALID IDS
ID 3 = 333

* Above example showing operators ID# 111, 222 and 333.

On the last valid operator ID number that you have inputed into the system you must press **“Enter key”** ↵ and then press **F** key.

At any time if you want to look at the current operators ID numbers already in the system, change or delate them you must input password **742F** while LCD display is showing “Enter ID Number”.

How to program operator(s) RFID access cards (If applicable)

The RFID operator access HID card reader is integrated into digital indicator housing with ScanWeight system having proprietary software that allows self programming, deleting and management of authorized vehicles operators on the any of the SkidWeigh products equipped with RFID card readers.

There is no need for any additional programming devices!

- **Turn ignition switch to on position**
- **The LCD display will indicate to “SCAN CARD”**

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1. Scan RFID MASTER CARD

LCD display will show

LCD Display
SCAN CARDS
< KEY TO EXIT

2. Scan first valid HID operator card.

The LCD display will show for the moment the value of the inputed card.
The LCD display will indicate that “CARD ADDED OK “and short beep once

LCD Display
SCAN MORE CARDS
< KEY TO EXIT

3. Scan second valid HID operator card.

Follow instructions shown on LCD display.
Keep adding the valid cards to vehicle. When all cards inputed into the system press **< KEY TO EXIT**
Lift Truck CubeFreight RFID Authorized Operator Access *System has a capability to add up to 250 valid operator cards.*
Note: ***Proceed with programming valid operator cards for each vehicle in your fleet.***

How to delete operator(s) RFID cards already in the system

Turn ignition switch to on position
The LCD display will indicate to “SCAN CARD” (as shown on the picture)

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Scan RFID MASTER CARD

LCD display will show

LCD Display
SCAN CARDS
< KEY TO EXIT

Scan first valid operator CARD that you want to delete from the system

LCD display will show the card ID# . Use left ◄ and right ► arrow key to change to **Y.**

LCD Display
FC:222 ID: 44444
DELETE(Y/N)? N

The current card ID# 44444 will be deleted from the system. LCD display will automatically show

LCD Display
SCAN MORE CARDS
< KEY TO EXIT

Scan next valid operator CARD that you want to delete from the system

Follow instructions shown on LCD display.
Keep adding cards to be deleted. When all cards inputed into the system press **<** KEY TO EXIT
Note: In the case that you need replacement of RFID MASTER CARD, please call us at 905-469-0985

How to disable RFID reader

Vehicle access enable function in case of lost HID master card, valid card(s) or reader malefaction
- With digital indicator showing " IVDT SCAN CARD" press and hold **F** key for 5 seconds
- LCD display will show PASSWORD =_
- Input **521** and RFID reader will be disabled. Vehicle will be operational without RFID operator card.

How to enable RFID reader

With digital indicator showing date / time press **F** key and than input number **9**.

- LCD display will show PASSWORD =_
- Input **521**

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< KEY TO SCROLL and follow instructions

LCD Display
RE-ACTIVATE RFID
ENTER TO SELECT

LCD Display
RE-ACTIVATE RFID
TURN ON RFID ? N

ProxPoint Plus RFID Card Reader / SkidWeigh Technology

Read Range Typical 3”
Operating Voltage 12 to 55 VDC
Operating Temperature (-35 C to 65C)
Operating Humidity 5-95% non-condensing
Transmit Frequency 125 kHz
Card Compatibility All 125 kHz HID Proximity cards, long and short formats, as well as Corporate 1000 cards formats
LED Type Bicolored (green and red)
Transient Surge and Reverse Voltage Protection
Extra Security, Recognizes card formats up to 85 bits with over 137 billion unique codes
Application for all kinds of lift trucks regardless of the vehicle make, type ,model or operating voltage
Self programming, no additional devices required to add or delete cards from the system
Memory capacity to up to 250 operators ID#
FCC Compliance, part 15 of the FCC rules

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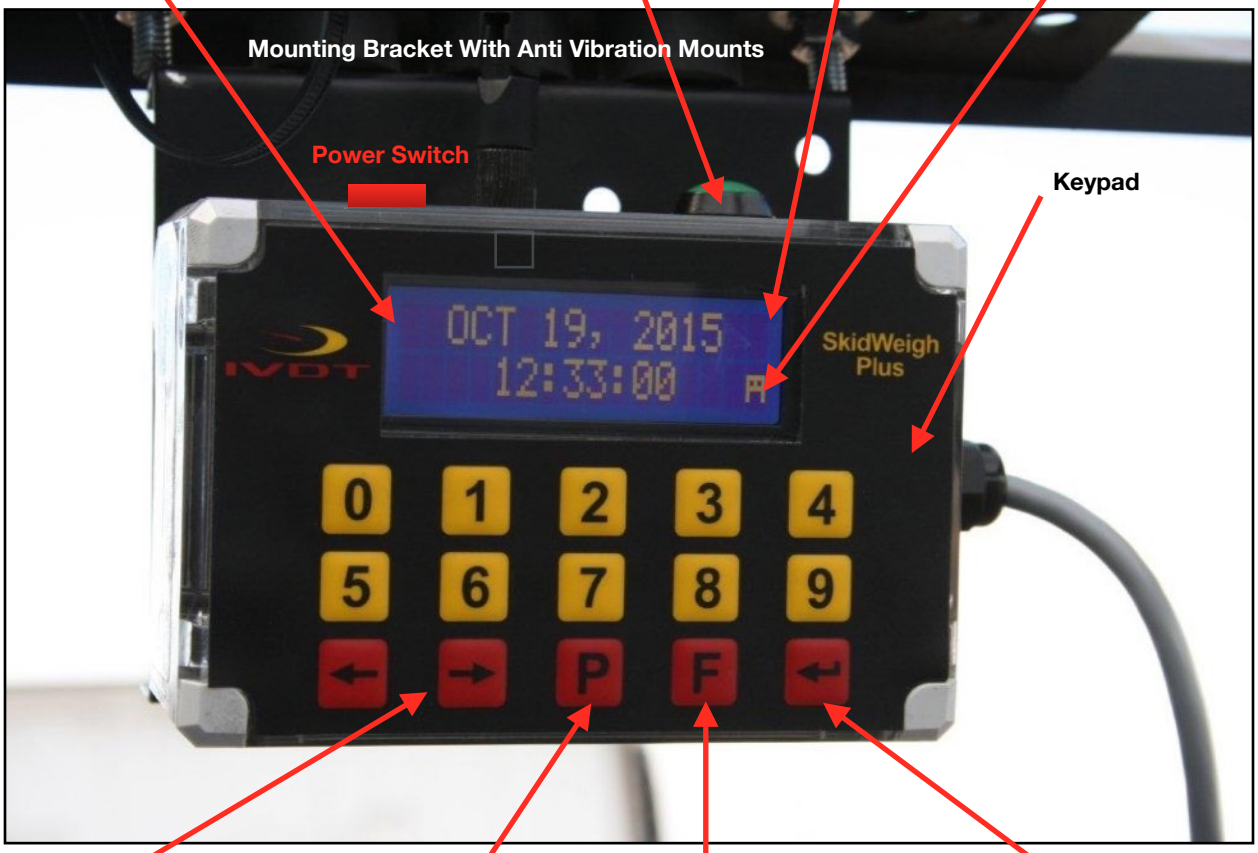

F 9 ADMINISTRATIVE MENU (Password protected)

F 0 OPERATOR MENU

Use < > keys for *Bluetooth pairing, *TARE set up, * Weight readout to be shown in kilograms.

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Administrative Menu

The administration menu allows the installation technician to calibrate system weighing function (SET CALIBRATION 1) and for the end user to manage data, set vehicle ID#, time/date or information available depending on the purchased hardware configurations.
To enter into the Administration Menu, press **F** key and than press **9** key.

Input password **521**
Use **< >** keys to scroll for functions that might apply for your system configuration.
Follow the LCD instructions, use **"Enter key"** ↵ to confirm set up input. Use **"F"** key to exit the menu.

LCD Display
MENU
Password = ___

LCD Display
<> KEY to SCROLL
F KEY TO EXIT

Date / Time Set Up

LCD Display
SET CLOCK
ENTER TO SELECT

LCD Display
SET CLOCK
AUTO _

Use left ◀ and right ▶ arrow key (bottom left side of the keypad) to change from AUTO to MANUAL Date/Time set up.

Note: AUTO set up refers to system utilizing a wireless RF platform with automatic Date /Time update from IVDT Base station communication and programming hub.

For the applications without Base Station, use SET CLOCK MANUAL _ instructions.

LCD Display
SET CLOCK
MANUAL _

To set Date / Time follow the LCD instructions and press **"Enter key"** ↵ to confirm.

LCD Display
Aug 28, 2010
12:20:23

Press **“Enter key”** ↵ to confirm the setting. The cursor will automatically move to the next item to be changed (Month, Day, Year, Hours, Minutes, Seconds). On the last correction, seconds item press **“Enter key”** ↵ to confirm new Date / Time set up.

Set vehicle ID#

- Maximum input number for vehicle ID# is 3 digits. Press **“Enter key”** ↵ to confirm.

LCD Display
<> KEY to SCROLL
F KEY TO EXIT

LCD Display
SET VEHICLE ID
ENTER TO SELECT

LCD Display
ENTER VEHICLE ID
1_

LCD Display
VEHICLE ID
CONFIGURATED

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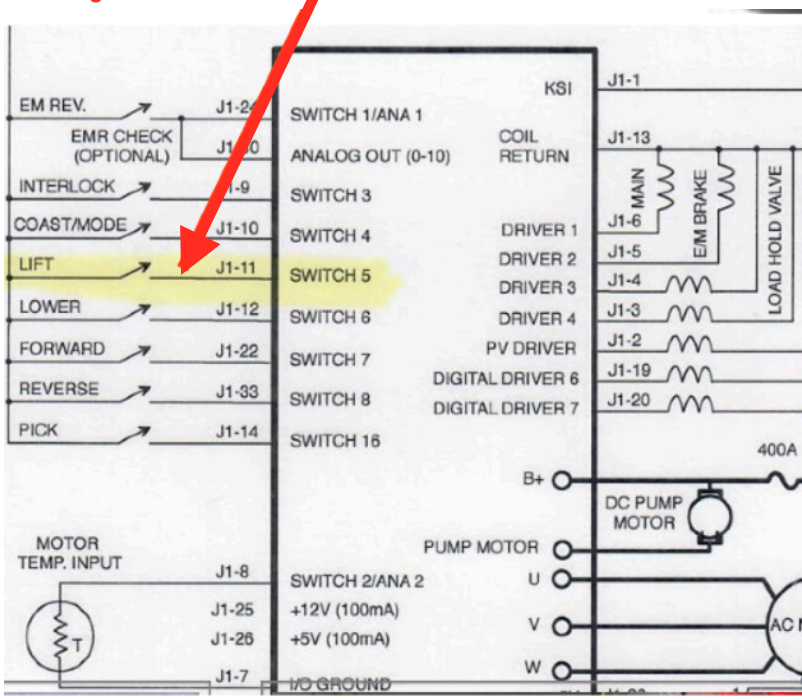
Use two BLACK wires and "splice" them in series with the operator activated lift control switch wire or signal wire on controller side that is activating lift motor.



Lift Accurate Technology

Automatic lift motor travel de-activation methods during the load weighing cycle

Two BLACK wires are connected to the internal relay, dry contacts located in the ED3/ED4-EP digital indicator. This internal relay is controlled by the microprocessor and activate only during the load weighing cycle. There is no power connected to these two BLACK wires. Internal relay configuration is SPST normally closed contacts,10 A current rating.

Method A. *(Newer electric pallet trucks with various CANbus controllers)*

Use two BLACK wires and "splice" them in series with the operator activated lift control switch wire or <u>signal wire on controller side</u> that is activating lift motor. The predetermined motion of the lifting cylinder and the load weight measurement "weighing cycle" will be initiated and controlled automatically by the software algorithm based on the input from the pressure transducer signal. Once the load weight is shown on the LCD display internal relay will be de-activated and the lift motion control event will be automatically enable.

Note: With vehicle stationary and during the lifting cycle diagnostic display on some vehicles might show "No power to lift motor" or audio signal might be activated for short time period.

Consult vehicle wiring diagram or contact the OEM for the proper interface to control lift motor travel.

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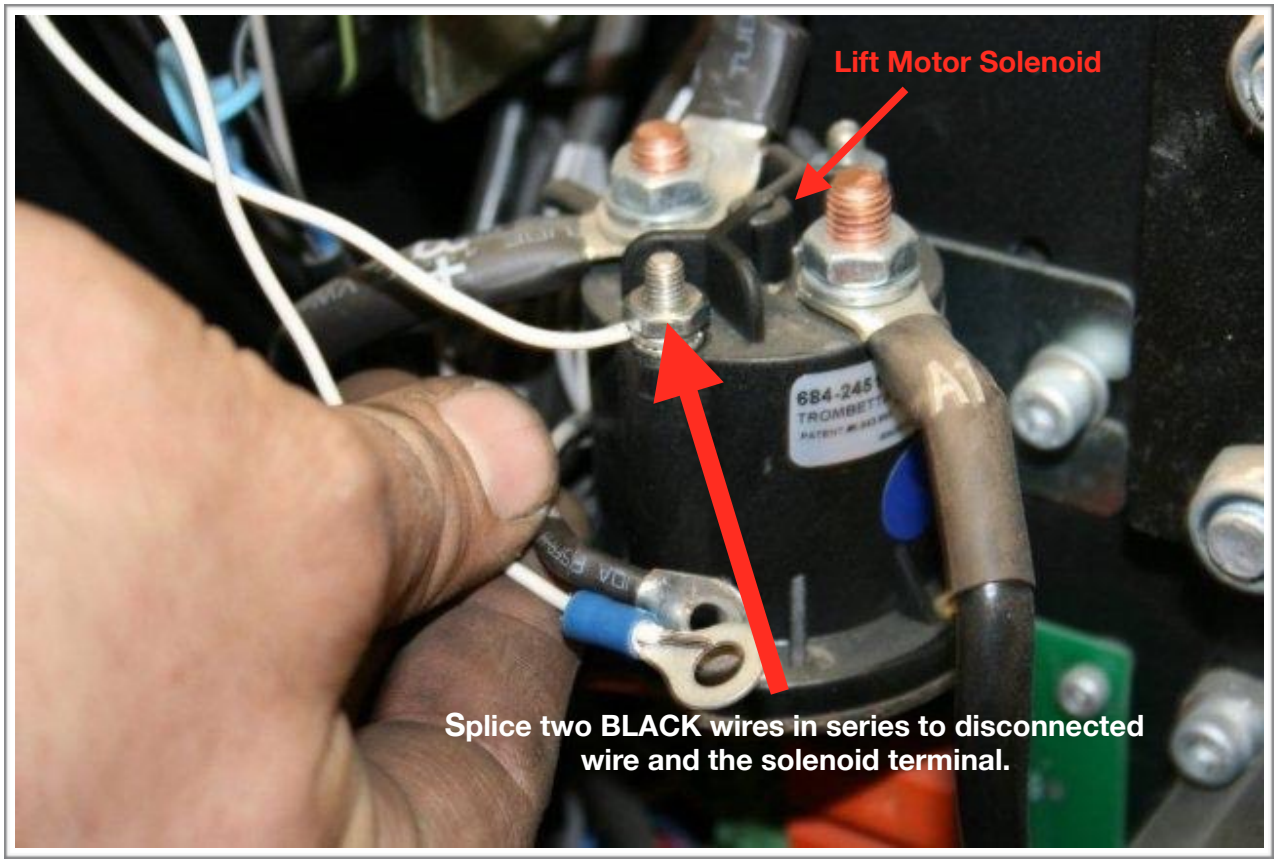
Method B. (*Some older electric pallet trucks with solenoid coil wiring interface*)

Use two Black wires and splice them in series with one of the lift solenoid coil wires activating the lift motor travel.

Disconnect one of the original solenoid coil wire (From either positive or negative terminal of the solenoid coil) and splice two BLACK wires in series to disconnected wire and the solenoid terminal.



The predetermined motion of the lifting cylinder and the load weight measurement “weighing cycle” will be initiated and controlled automatically by the software algorithm based on the input from the pressure transducer signal.

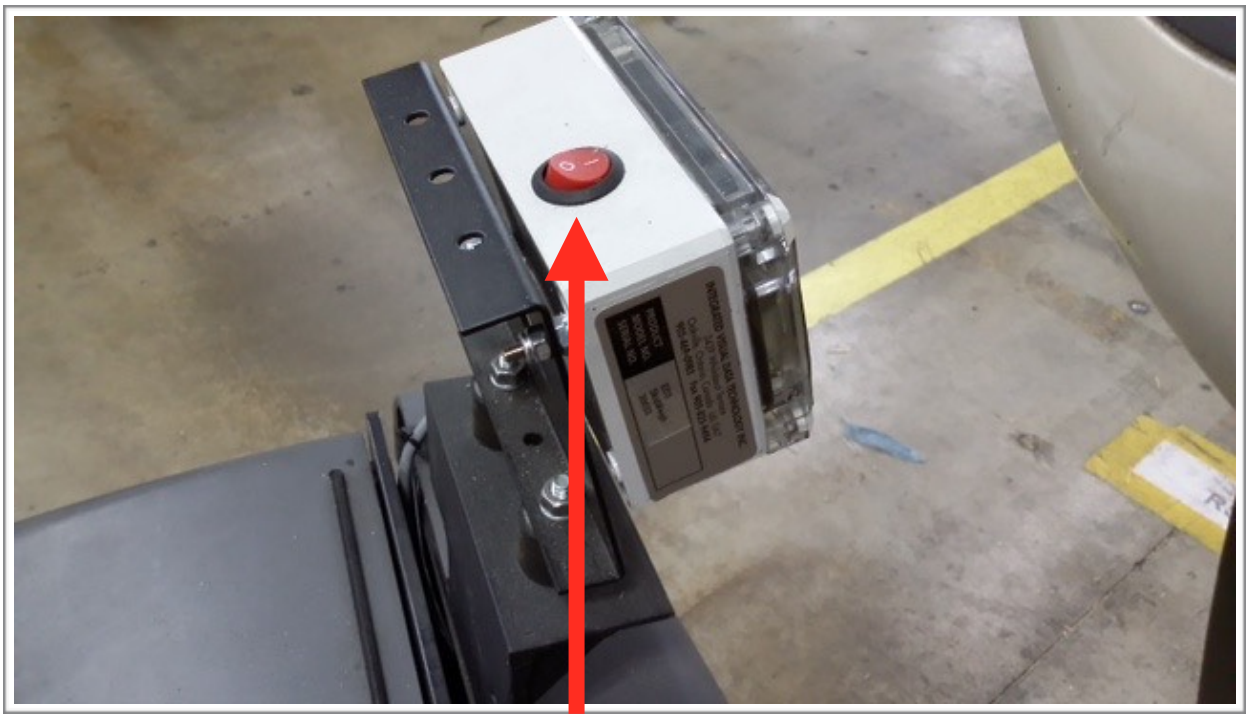
Once the load weight is shown on the LCD display internal relay will be de-activated and the lift motion control will be enabled.

(With vehicle stationary and during the lifting cycle diagnostic display on some vehicles might show “No power to lift motor” or audio signal might be activated for short time period.)

When unloaded vehicle is in motion the hydraulic “spikes from pressure transducer signal” might be seen by the vehicle controller as start of the “weighing cycle”. Short interruption of the power to the lift solenoid coil on “some controllers” could be seen as a “fault” and power to the vehicle will be cut.

Solution:

When the weighing function is not used turn indicator power switch to OFF position.



ED3/ED4-EP System Power On / Off Switch

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Weighing scale function calibration

The ED3/ED4-EP CubeFreight calibration is automatic and is done by lifting empty and loaded forks with known load weight. MAKE SURE THAT YOU HAVE A KNOWN LOAD WEIGHT AND KEEP IT NEARBY TO COMPLETE THE CALIBRATION. For the best results use at least minimum calibration load test weight of 30 to 50% of maximum lifting capacity of the lift truck. Use customer floor scale or find a known skid load weight within the operational facility.

IMPORTANT:

The ED3-EP or ED4-EP system MUST BE CALIBRATED WITH KNOWN LOAD WEIGHT IN POUNDS

Note: Should operation require for load weight to be shown in kg, press **F** key and number **0** and change **WEIGHT DISPLAY** to kg *after the system being calibrated in pounds*.

Calibration

Lower the empty forks to the ground. There should be no hydraulic pressure in lift hydraulic circuit. Follow instructions shown on the LCD display

To enter in the Administration Menu, press **"F"** key and than press **9** key and input password **521**. Use left or right arrow keys to scroll to **"CALIBRATION 1"** menu.

Press **"Enter key"** ↵ and follow the LCD instructions.

LCD Display
<> KEY TO SCROLL
F KEY TO EXIT

LCD Display
CALIBRATION 1
ENTER TO SELECT

LCD Display
CALIBRATION 1
LIFT EMPTY FORKS

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Activate and hold lift motor control switch until lifted empty forks are automatically stopped.

System zero load calibrated value will be recorded. After few seconds the LCD display will show "LOWER FORKS".

LCD Display
CALIBRATION 1
LOWER FORKS

Lower the empty forks to the ground. The LCD display prompt you to input known calibration load weight in pounds.

LCD Display
CALIBRATION 1
WEIGHT = ❑

Pick up a known load weight and lower the loaded forks to the ground.
(Our example of the known load weight is 4000 pounds)

LCD Display
CALIBRATION 1
WEIGHT = 4000

Input into the system the known load weight of 4000 and press **"Enter key"** ↵.
The LCD display will show "LIFT LOAD".

LCD Display
CALIBRATION 1
LIFT LOAD

Activate and hold lift motor control switch until lifted loaded forks are automatically stopped.

LCD Display
CALIBRATION 1
LOWER FORKS

After few seconds the calibrated load weight value of 4000 will be stored in the system memory and LCD display will prompt you to lower “LOWER FORKS”.

LCD Display
CALIBRATION 1
CONFIGURATED

As soon the loaded forks are lowered to the ground LCD will show Data / Time.

LCD Display
AUG 28, 2010
12:25:23

Calibration of the ED3/ED4-EP system weighing function is finished.

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Saving recorded data to USB memory stick

The ED3/ED4-EP CubeFreight system will allow you to download all recorded data to the memory stick. Follow instructions shown on the LCD display. This function is located in Administrative Menu.

LCD Display
<> KEY TO SCROLL
F KEY TO EXIT

LCD Display
SAVE TO USB
ENTER TO SELECT

LCD Display
SAVING TO USB
– – – – – -

LCD Display
ERASE SDRAM ? N

When the system has finished uploading the data to the USB memory stick the LCD display will prompt you to erase the SDRAM , all files contained on the SKidWeigh Plus ED3/ED4-EP.
Once you have made your selection **Y** or **N** press **“Enter key”** ↵ to confirm selection and the system will automatically bring you back to the main

LCD Display
<> KEY TO SCROLL
F KEY TO EXIT

LCD screen in the administrator menu. Press **“F”** key to exit the administrator menu.

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Operator Usage Guide

Automatic Measurement Cycle

The CubeFreight system requires automatic weighing cycle to be initiated with barcode scanner or by activating "By Pass Switch". The "By Pass Switch" is used in case that barcode scanner is not available, damaged, barcode label damaged or the operation requires the load weight readout without barcode label ID# readout.

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Operator Usage Guide (Application with Barcode Scanner)

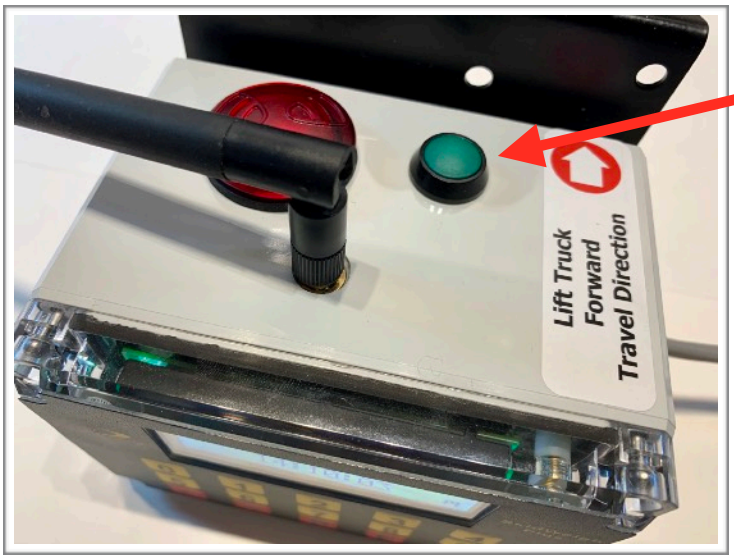
- Turn ignition switch
- Scan valid operator RFID card if applicable.

1. **Note:** Input an operator ID# and press **"Enter key"** ↵ if keypad operator access control is used. *If applicable complete OSHA safety check procedure.*

LCD Display
ENTER ID NUMBER
ID = _

LCD Display
Aug 11, 2011
11:19:38

- Insert the forks into the pallet or under the product to be weighed.
- **Lower the loaded forks to the ground.**
- With LCD display showing Date/Time **scan pallet barcode ID#** and follow instruction shown on LCD display.



Barcode "By Pass Button"

*(Should the barcode scanner be not available or barcode is damaged and not be readable, press **GREEN** button **only once** to continue with measurement cycle.*
Input pallet ID# by keypad each number and press **"Enter key"** ↵
On last ID# number press **"Enter key"** ↵ *again.*

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2. LCD display will show the barcode scan ID# for a moment and display will advance to *"Pallet sizes menu"* showing default PALLET SIZE **48 x40**. This menu has all of the most popular pallet sizes and manual input for non palletized loads. Use **< >** key to select other pallet size and press **"Enter key"**.

3. Next LCD display show will be SELECT PALLET HEIGHT. Input pallet height (Inches) and press **"Enter key".** The LCD display will prompt you to lift loaded forks. Activate lift control switch and **hold it until loaded forks are stopped automatically**. Within few seconds LCD display will show load weight.

CubeFreight Data Session

- Date/Time
- Vehicle ID#
- Barcode ID#
- Operator ID#
- Freight size, WIDTH, LENGTH and HEIGHT
- Load weight

* Optional: Impact, overload, OSHA safety

The measurement session is completed.

The CubeFreight date will be automatically send to the USB port or/and RF Base Station without operator input.

4. **For non palletized freight** use **< >** key in pallet size menu and select PALLET SIZE MANUAL and press **"Enter key".** Input WIDTH, LENGTH and HEIGHT and press **"Enter key".** The LCD display will prompt you to lift loaded forks. Within few seconds LCD display will show load weight.
The measurement session is completed.

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Operator Usage Guide (Application with Bluetooth Mobile Printer)

The CubeFreight system using mobile Bluetooth printer requires automatic weighing cycle to be initiated by activating “By Pass Switch”, **pressing it once**. Press GREEN button and use keypad to input palletized load ID#“. After each keypad number input press **“Enter key”**.

1. With LCD display showing Date/Time press GREEN **button only once.**

2. LCD display will prompt operator to input the pallet load ID#. Use keypad and input load ID# and make sure that you press **“Enter key”** after each digit entered into the system. On last ID# digit input press **“Enter key”** to advance to **default** PALLET SIZE 48 x40 menu. This menu has all of the most popular pallet sizes and manual input for non palletized loads. Use **< >** key to select other pallet size and press **“Enter key”.** Use **< >** key to select other pallet size and press **“Enter key”.**

3. Next LCD display show will be SELECT PALLET HEIGHT. Input pallet height and press **“Enter key”.** The LCD display will prompt you to lift loaded forks. Activate lift control switch and **hold it until loaded forks are stopped automatically**. Within few seconds LCD display will show load weight.

The measurement session is completed.

The CubeFreight date in addition to printout ticket will be automatically send to the USB port or/ and RF Base Station without operator input.

4. **For non palletized freight** use **< >** key in pallet size menu and select PALLET SIZE MANUAL and press **“Enter key”.** Input WIDTH, LENGTH and HEIGHT and press **“Enter key”.** The LCD display will prompt you to lift loaded forks.

The measurement session is completed.

CubeFreight Ticket Printout

- Date/Time
- Vehicle ID#
- Barcode ID#
- Operator ID#
- Freight size, WIDTH, LENGTH and HEIGHT
- Load weight

* Optional: Impact, overload, OSHA safety

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OSHA Safety Check (If applicable)

The OSHA safety check will be automatically initiated every 8, 12 hours or daily.
Default value shown on LCD display is (**F**) representing “fail”.
Use **< >** key to change. Follow the LCD messages menu and press **“Enter key”** ↵ after choosing **F** or **P**

F = Fail and (P)= Pass